



First record of *Urotheca dumerilli* (Bibron, 1840) (Squamata: Dipsadidae) in Cauca state, Colombia and notes on natural history

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Abstract: *Urotheca dumerilli* has been rediscovered after 44 years through a single specimen collected at sector El Cóndor, Parque Nacional Natural Munchique, municipality of El Tambo, Cauca State, Colombia. Herein we present the coloration in life and description of fully everted hemipenis of the species for first time, with notes on geographical distribution and natural history.

Key words: snakes, Munchique, Cauca, Colombia, endemic species, hemipenis

After its description, the genus *Urotheca* Bibron, 1843 has had several changes according to later opinions and/or evidences of several authors. First, Dunn (1944) used the name *Rhadinaea* Cope, 1863 over *Urotheca* based on the not well-established type species of the latter but thereafter (1957) changed his opinion and suggested that all species of *Rhadinaea* should be placed in *Urotheca* and this concept was followed by Roze (1958, 1959, 1964, 1966). Later, Myers (see discussion, 1974) rejected *Urotheca* and retained *Rhadinaea* in the interest of nomenclatural stability and proposed several species groups for this genus. Subsequently, Savage and Crother (1989) synonymized the *lateristriga* group (*sensu* Myers 1974) and the species of *Pliocercus* Cope, 1860 within *Urotheca* based on similarities of hemipenial and tail structures. Although Myers and Cadle (1994) accepted *Urotheca*, they resurrected *Pliocercus*, and suggested that both genera are monophyletic sister groups. Finally, Sheehy (2012) synonymized *Pliocercus* within *Urotheca* again through molecular evidence.

Urotheca dumerilli, the type species of the genus, was described from a single specimen from “Cuba” but later Myers (1974), suggested that the holotype (Muséum National d’Histoire Naturelle, Paris: MNHM 733) probably came from Colombia, based on three more

specimens from this country: one from “Peña Lisa, Condoto, Chocó (British Museum of Natural History, London: BMNH 1914.5.21.46)”, another from “Medellín, departamento de Antioquia (American Museum of Natural History, New York: AMNH 35490)” and the last one from “Quebrada Pangala, Río San Juan, Chocó (AMNH 103823)”. Forty-four years after the last collected specimen *Urotheca dumerilli* was found again through a single male individual found active during the day (10:00 h) on 27 July 2013 at sector El Cóndor, Parque Nacional Natural Munchique, municipality of El Tambo, Cauca state (02°43′07.7″ N, 076°56′41.5″ W, 1,538 m above sea level). The specimen was deposited in the herpetological collection of the Museo de Historia Natural, Universidad del Cauca, Popayán, Colombia (MHNUC-Se-000510).

This new record extends the geographical distribution of the species (Figure 1). In revising the geographical distribution map of the species, we used the following considerations: coordinates from “Peña Lisa, Condoto, Chocó state” were taken from Wilson (1992) and the coordinates from “Quebrada Pangala, Río San Juan, Chocó state” and “Medellín, Antioquia state” were calculated using Google Earth™ version 7.1.2.2041. We chose an aleatory point within the length of “Quebrada Pangala” located at the municipality of Litoral de San Juan, Chocó state.

Specimen MHNUC-Se-000510 has a snout-vent length of 28.4 cm and an incomplete tail of 9.2 cm. Broken tails have been reported for most species of the *lateristriga* group including the type species *U. dumerilli* and even *Pliocercus*, which also has the disproportionately long and thickened but fragile tails of these snakes (Liner 1960; Wilson 1968; Myers 1974; Savage and Crother 1989). Species identification was based on the taxonomic key and the species diagnosis of *Rhadinaea* (*sensu lato*) (Myers 1974) according to the following characteristics: dorsal scale rows 17/17/17;

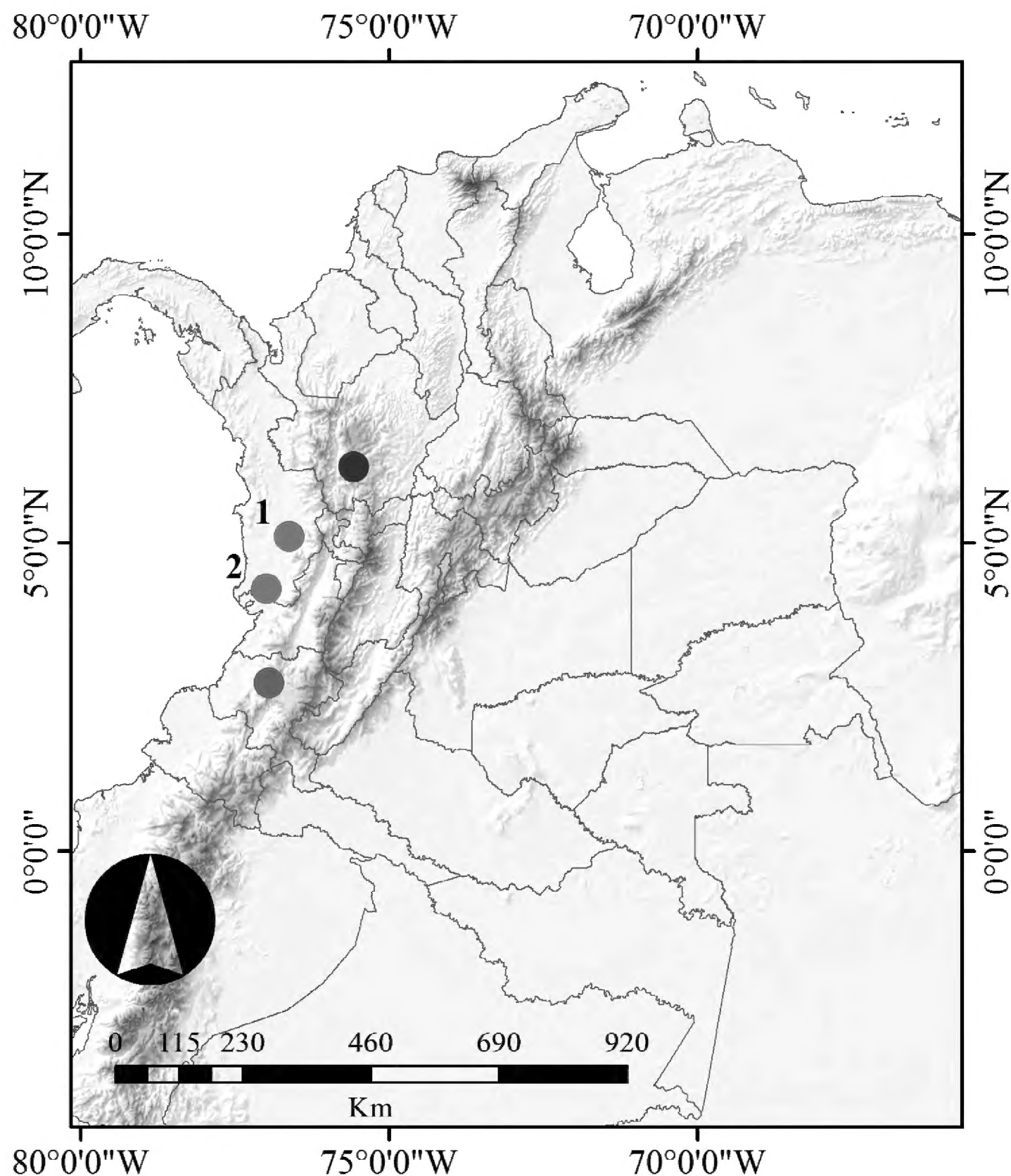


Figure 1. Geographic distribution of the Colombian endemic species *Urotheca dumerilli*. Green dot indicates Medellín, Antioquia State; Yellow dots indicate (1) Peña Lisa, Condoto and (2) Quebrada Pangala, Río San Juan both from Chocó State; and red dot represents the new locality in Sector El Cóndor, Parque Nacional Natural Munchique, municipality of El Tambo, Cauca State.

postoculars two; preoculars two, subpreocular one; temporals 1+2; supralabials eight, the fourth, fifth and sixth bordering the orbit; infralabials nine, the first six in contact with the chinshields; ventrals 128; subcaudals 41; a single white spot on each side of the neck, above and slightly behind the corner of the mouth.

Dorsal coloration in life of *U. dumerilli* (Figure 2) consists of head and nape light brown, supralabials white, some with dark brown sutures. The brown or grayish brown dorsal color pattern and the “whitish” poorly defined line or narrow stripe that extends from below the angle of the jaws and along the lower one and one-half scale rows of the neck, for a distance of about 12 ventrals described by Myers (1974) are actually dark green and yellow respectively. Ventral coloration in life also differs from Myers’ original description and revision of AMNH 103823 one month after its preservation: the venter is not uniform yellowish orange or white but is



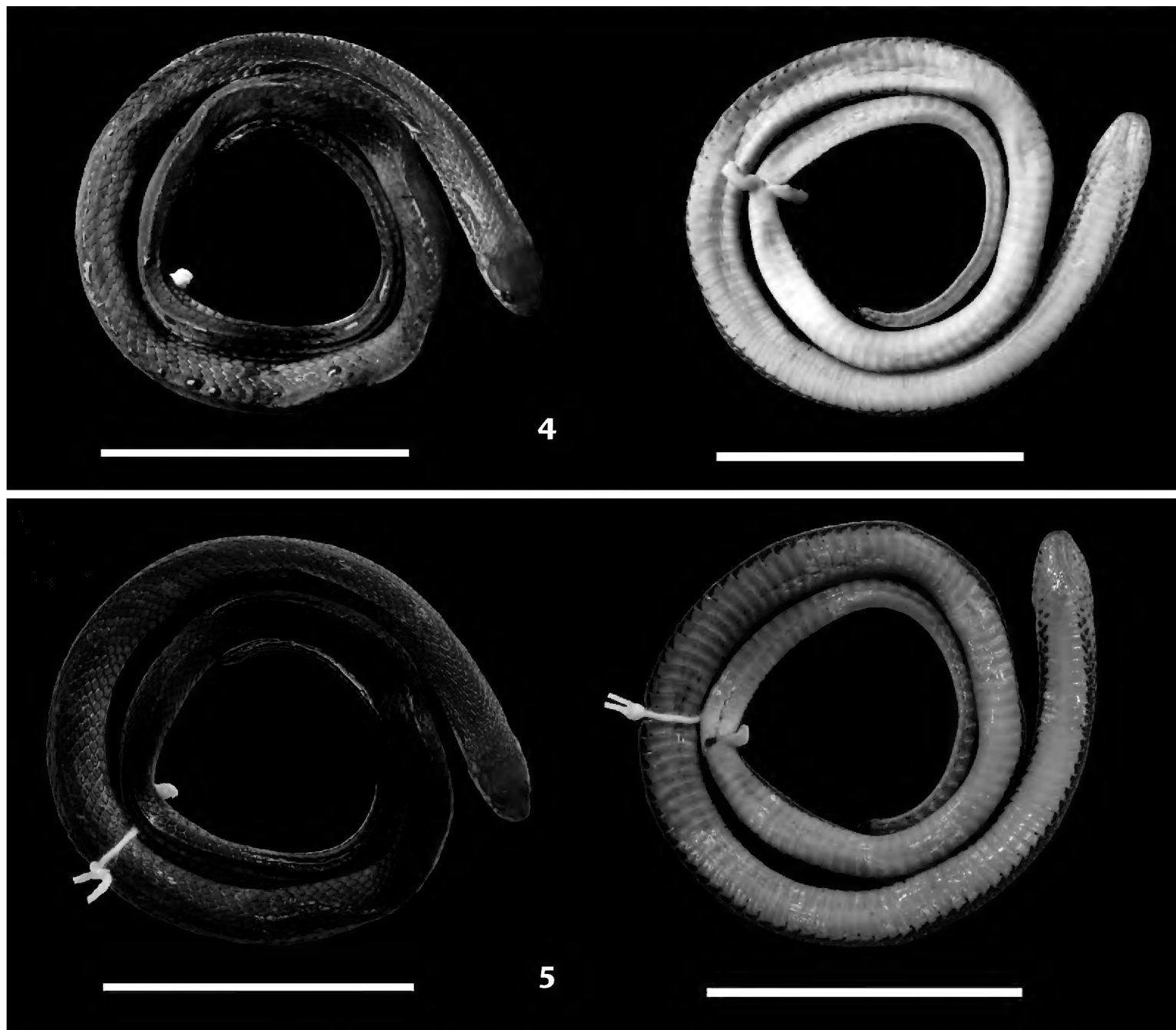
Figure 2. Dorsal coloration in life of *Urotheca dumerilli* from sector El Cóndor, Parque Nacional Natural Munchique, municipality of El Tambo, Cauca State, Colombia.



Figure 3. Ventral coloration in life of *Urotheca dumerilli* from sector El Cón-dor, Parque Nacional Natural Munchique, municipality of El Tambo, Cauca State, Colombia.

white from the mental to preventral scales, where it becomes yellow and continues to two-thirds of the body length, whereupon it becomes white again until the end of the tail (Figure 3). Coloration changes very quickly in preservative (Figures 2–5). Only four days after fixing in 10% formalin the dorsal coloration became dark brown, top of head and nape turned reddish and the white and yellow portions of venter (except the tail) became cream and light green respectively (Figure 4). After seven months in 70% alcohol the dorsal coloration was light brown on the head, nape and anterior portion of the body and dark brown posteriorly while the venter becomes uniformly cream (Figure 5).

The hemipenial description of the holotype of *Urotheca dumerilli* provided by Myers (1974: 178) is confusing because he says in the text: “The preceding description is based on the left, retracted hemipenis of the holotype, MNHN 733 (illustrated)” but in illustration appears “... right organ”, so when the retracted organ is everted it appears as a mirror image and thus the direction of the base of sulcus spermaticus indicates that it is in fact, as the text says, the left organ. The preceding observation also could occur in other illustrations of retracted hemipenis of *Rhadinaea* (*sensu lato*) (Myers 1978) in which the direction (left or right) of the base of sulcus spermaticus is evident, with the difference that the organ referred to in text and figures is the same.



Figures 4–5. Coloration change of *Urotheca dumerilli* (MHNUC-Se-000510). **4:** After four days in 10% formalin. **5:** Seven months in preservative. Scale bars = 50 mm.

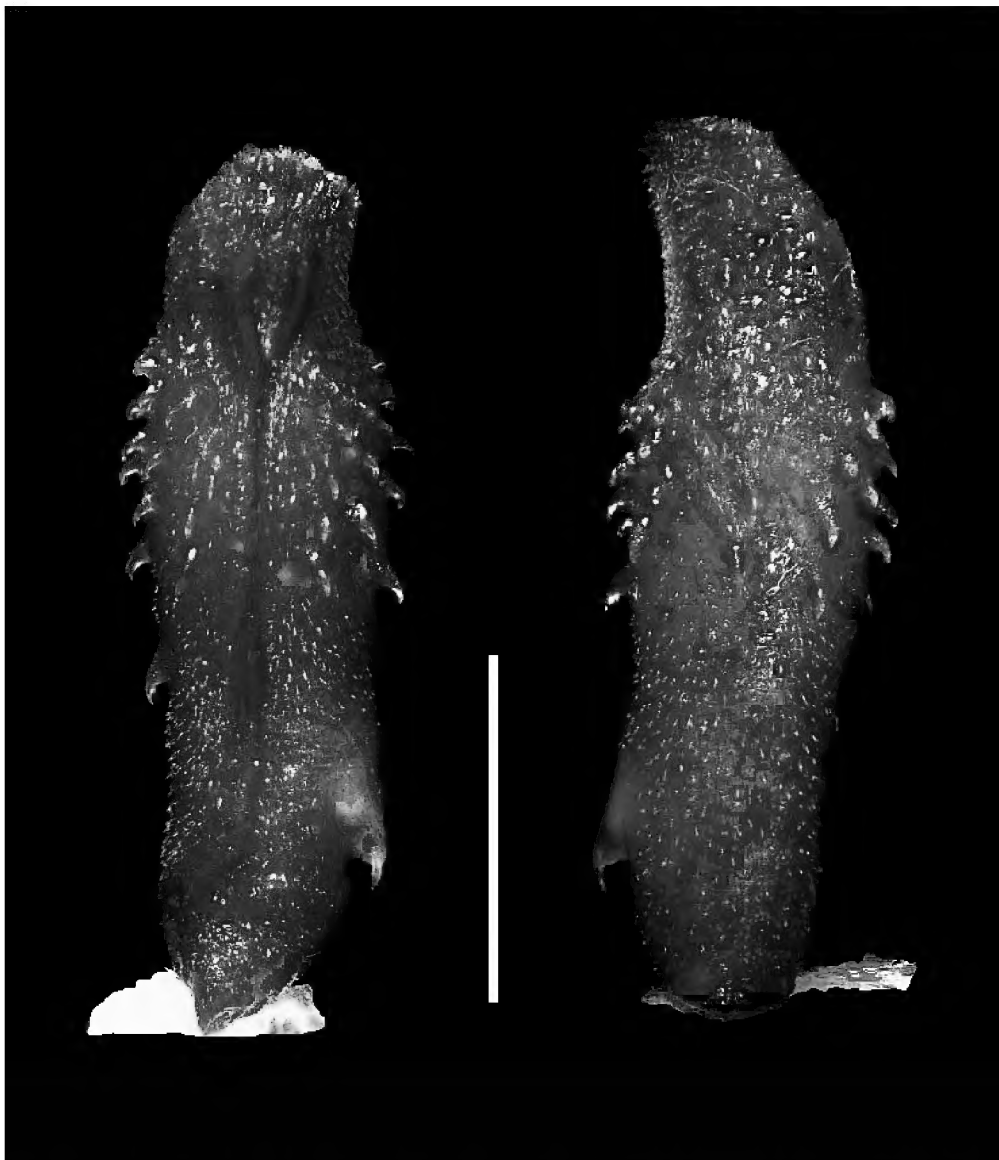


Figure 6. Left hemipenis of *Urotheca dumerilli* (MHNUC-Se-000510). Sulcate (left) and asulcate (right) surfaces. Scale bar = 5 mm.

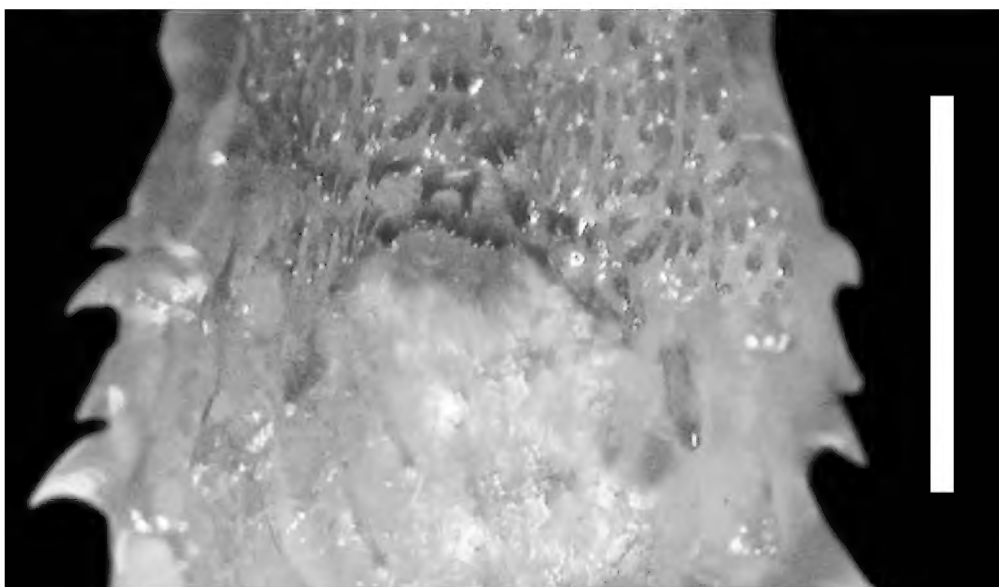


Figure 7. Detail of naked pocket on hemipenial capitulum of *Urotheca dumerilli* (MHNUC-Se-000510). Asulcate surface of left organ. Scale bar = 2 mm.

Myers (1974) suggested that some observations of the hemipenis of *U. dumerilli* need to be verified, so we herein describe the left hemipenis of specimen MHNUC-Se-000510 (Figure 6). We prepared the organ following the methods of Myers and Cadle (2003) and Zaher and Prudente (2003) and almost maximally expanded with the injection of colored petroleum jelly, and stained with Alizarin Red to improve the visualization of calcareous spines (Uzzell 1973).

Unilobed and noncapitate hemipenis of 12.5 mm total length curved toward the sulcate surface more strongly in the capitulum; proximal portion of hemipenial body is covered by many spinules and a large lateral spine (right side on sulcate view of left organ); distal

portion of hemipenial body is covered by 50 medium-sized spines that are longer on the asulcate and lateral surfaces; one of these spines is located proximally to the others (left side of sulcate view); a very small and shallow pocket is present between a nude area at the end of the hemipenial body and the anterior margin of the capitulum on the asulcate surface (Figure 7); lobe covered by small spinules proximally followed by a large number of papillae that form few calyces at the second third of the capitulum length; sulcus spermaticus forked directly in the capitulum with branches that extend almost to the end of the organ. Verification of the presence of a naked pocket on the asulcate surface of the hemipenial capitulum in the type species presented herein reinforces the importance of this character as one of principals to the diagnosis of the genus *Urotheca*.

At sector El Cóndor, Parque Nacional Natural Munchique, *Urotheca dumerilli* is sympatric with its easily distinguishable congeners *U. lateristriga* (Berthold, 1859) and *U. euryzonus* (Cope, 1862). Although the three species were found only in high anthropically disturbed habitats (e.g., pastures, crops) we cannot suggest that they are strictly associated with this kind of habitat due to its proximity to forest habitats.

Finally, this discovery of *Urotheca dumerilli* represents the first record in Cauca state, Colombia and extends the distribution of this Colombian endemic species at least 169 km in a straight line from Quebrada Pangala, municipality of San Juan del Litoral, Chocó state to sector El Cóndor, Parque Nacional Natural Munchique, municipality of El Tambo, Cauca state. Because of the species' geographical distribution along the western slope of the Colombian western cordillera, we believe that it also could be present in Valle del Cauca state.

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LITERATURE CITED

- Dunn, E.R. 1944. A revision of the Colombian snakes of the genera *Leimadophis*, *Lygophis*, *Rhadinaea*, and *Pliocercus*, with a note on Colombian *Coniophanes*. *Caldasia* 2(11): 479–495. doi: 10.2307/23640977
- Dunn, E.R. 1957. Neotropical frog genera: *Prostherapis* versus *Hyloxalus* with remarks on *Phylllobates*. *Copeia* 1957(2): 77–78. doi: 10.2307/1439390
- Liner, E.A. 1960. A new subspecies of false coral snake (*Pliocercus elapoides*) from San Luis Potosí, Mexico. *The Southwestern*

- Naturalist 5: 217–220. doi: 10.2307/3668945
- Myers, C.W. 1974. The systematics of *Rhadinaea* (Colubridae), a genus of New World snakes. Bulletin of the American Museum of Natural History 153: 1–262. <http://hdl.handle.net/2246/605>
- Myers, C.W. and J.E. Cadle. 1994. A new genus for South American snakes related to *Rhadinaea obtusa* Cope (Colubridae) and resurrection of *Taeniophallus* Cope for the “*Rhadinaea*” *brevirostris* group. American Museum Novitates 3102: 1–33. <http://hdl.handle.net/2246/4934>
- Myers, C. and J.E. Cadle. 2003. On the snake hemipenis, with notes on *Psomophis* and techniques of eversion: a response to Dowling. Herpetological Review 34(4): 295–302.
- Roze, J.A. 1958. A new species of the genus *Urotheca* (Serpentes: Colubridae) from Venezuela. Breviora 88: 1–5. <http://www.biodiversitylibrary.org/page/3190592>
- Roze, J.A. 1959. Taxonomic notes on a collection of Venezuelan reptiles in the American Museum of Natural History. American Museum Novitates 1934: 1–14. <http://hdl.handle.net/2246/4351>
- Roze, J.A. 1964. The snakes of the *Leimadophis-Urotheca-Liophis* complex from Parque Nacional Henri Pittier (Rancho Grande), Venezuela, with a description of a new genus and species (Reptilia, Colubridae). Senckenbergiana Biologica 45: 533–542.
- Roze, J.A. 1966. La taxonomía y zoogeografía de los ofidios en Venezuela. Caracas: Universidad Central de Venezuela, Ediciones de la Biblioteca. 362 pp.
- Savage, J.M. and B.I. Crother. 1989. The status of *Pliocercus* and *Urotheca* (Serpentes: Colubridae), with a review of included species of coral snake mimics. Zoological Journal of the Linnean Society 95: 335–362. doi: 10.1111/j.1096-3642.1989.tb02315.x
- Sheehy III, C.M. 2012. Phylogenetic relationships and feeding behavior of Neotropical snail-eating snakes (Dipsadinae, Dipsadini) [Ph.D. dissertation]. Arlington, Texas: The University of Texas at Arlington. 126 pp.
- Uzzell, T.M. 1973. A revision of lizards of the genus *Prionodactylus*, with a new genus for *P. lecostictus* and notes on the genus *Euspondylus* (Sauria: Teiidae). Postilla 159: 1–67.
- Wilson, L.D. 1968. A fracture plane in the caudal vertebrae of *Pliocercus elapoides* (Serpentes: Colubridae). Journal of Herpetology 1: 93–94. doi: 10.2307/1563268
- Wilson, L.D. 1992. *Tantilla nigra*. Catalogue of American Amphibians and Reptiles 548: 1.
- Zaher, H. and A.L.C. Prudente. 2003. Hemipenes of *Siphlophis* (Serpentes, Xenodontinae) and Techniques of Hemipenial Preparation in Snakes: A Response to Dowling. Herpetological Review 34(4): 302–307.

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